



**Rules and Regulations  
for the Classification  
of Special Service Craft,  
July 2012**

**Notice No. 5**

Effective Date of Latest  
Amendments:

See page 1

Issue date: February 2013

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# **RULES AND REGULATIONS FOR THE CLASSIFICATION OF SPECIAL SERVICE CRAFT, *July 2012***

## **Notice No. 5**

This Notice contains amendments within the following Sections of the *Rules and Regulations for the Classification of Special Service Craft, July 2012*. The amendments are effective on the dates shown:

<b><i>Part</i></b>	<b><i>Chapter</i></b>	<b><i>Section</i></b>	<b><i>Effective date</i></b>
1	3	10	1 July 2013
7	7	4	Corrigenda
10	1	7	1 July 2013
13	4	1	1 July 2013
15	1	13	Corrigendum
15	3	4	1 July 2013
16	1	1, 2	1 July 2013
16	2	1, 7, 9, 10, 11, 13, 17, 20	1 July 2013

It will be noted that the amendments also include corrigenda, which are effective from the date of this Notice.

The *Rules and Regulations for the Classification of Special Service Craft, July 2012* are to be read in conjunction with this Notice No. 5. The status of the Rules is now:

Rules for Special Service Craft	Effective date:	July 2012
Notice No. 1	Effective date:	1 October 2012
Notice No. 2	Effective date:	1 January 2013 & Corrigenda
Notice No. 3	Effective date:	1 January 2013 & Corrigenda
Notice No. 4	Effective date:	1 July 2013 & Corrigendum
Notice No. 5	Effective date:	1 July 2013 & Corrigenda

## Part 1, Chapter 3

### Periodical Survey Regulations for Service Craft

Effective date 1 July 2013

#### ■ Section 10

#### Electrical equipment

##### 10.1 Annual and Intermediate Surveys

10.1.1 The electrical contacts of air circuit-breakers are to be visually inspected and maintained in accordance with the manufacturer's recommendations by suitably qualified and trained personnel. Appropriate maintenance records are to be made available to the attending Surveyor on request.

Existing paragraph 10.1.1 has been renumbered 10.1.2.

## Part 7, Chapter 7

### Failure Modes Control

#### CORRIGENDA

#### ■ Section 4

#### Buckling control

##### 4.3 Plate panel buckling requirements

Table 7.4.3 Buckling stress of secondary stiffeners (Part only shown)

Mode	Elastic buckling stress, N/mm <sup>2</sup>	Critical buckling stress, N/mm <sup>2</sup> see Note
(a) Overall buckling (perpendicular to plane of plating without rotation of cross-section)	$\sigma_{e(a)} = C_f 0,001 E \frac{I_a}{A_{te} I_e^2}$	$\sigma_{c(a)}$

##### 4.6 Shear buckling of stiffened panels

(Part only shown)

4.6.2 The elastic shear buckling stress of longitudinally stiffened panels between primary members may be taken as:  
where

$$\omega = \frac{10I_{se}}{lt^3}$$

## Part 10, Chapter 1

### Diesel Engines

Effective date 1 July 2013

#### ■ Section 7

#### Starting arrangements

##### 7.1 Dead craft condition starting arrangements

7.1.5 For cargo craft of less than 500 gross tons and which are not required to comply with the *International Convention for the Safety of Life at Sea, 1974*, as amended (SOLAS 74), alternative arrangements to those specified in 7.1.3 or 7.1.4 may be proposed for consideration. Details of the alternative arrangements are to be included in the documentation required by 2.1.5 and are to demonstrate:

- (a) equivalence to 7.1.3 or 7.1.4 is achieved;
- (b) compliance with the applicable statutory requirements of the National Authority of the country in which the craft is to be registered.

## Part 13, Chapter 4

### Shaft Vibration and Alignment

Effective date 1 July 2013

#### ■ Section 1

#### Shaft alignment

##### 1.2 Particulars to be submitted for approval – Shaft alignment calculations

1.2.1 Shaft alignment calculations are to be submitted to Lloyd's Register (hereinafter referred to as 'LR') for approval for the following shafting systems, except where stated otherwise:

- (a) All geared installations where the screwshaft has a diameter of 300 mm or greater in way of the aftmost bearing.
- (b) All direct drive installations which incorporate three or fewer bearings supporting the intermediate and screwshaft aft of the prime mover.
- (c) Where prime movers or shaftline bearings are installed on resilient mountings.
- (d) Multiple input/single output geared installations, in which case all such installations will be submitted for approval, regardless of shaft diameter.

1.2.2 The shaft alignment calculations are to take into account the:

- (a) thermal displacements of the bearings between cold static and hot dynamic machinery conditions;
- (b) buoyancy effect of the propeller immersion due to the craft's operating draughts;
- (c) effect of predicted hull deformations over the range of the craft's operating draughts, where known;
- (d) gear forces, where appropriate;
- (e) ~~for multi-engined installations, possible contributions in the mode of operation~~ combinations of engine inputs for multiple input and single output installations;
- (f) propeller offset thrust effects, where applicable;
- (g) bearing loading in the horizontal plane, where appropriate; and
- (h) bearing wear down, where applicable, and its effect on the bearing loads.

## Part 15, Chapter 1

### Piping Design Requirements

#### CORRIGENDUM

#### ■ Section 13

### Requirements for flexible hoses

#### 13.4 Testing

13.4.2 For a particular hose type complete with end fittings, the tests, as applicable, are to be carried out on different nominal diameters for pressure, burst, impulse and fire resistance in accordance with the requirements of the relevant standard. The following standards are to be used as applicable:

- ISO 6802 – *Rubber and plastics hoses and hose assemblies with wire reinforcements – Hydraulic pressure impulse test without with flexing.*
- ISO 6803 – *Rubber and or plastics hoses and hose assemblies – Hydraulic-pressure impulse test with without flexing.*
- ISO 15540 – *Ships and marine technology – Fire resistance of hose assemblies – Test methods.*
- ISO 15541 – *Ships and marine technology – Fire resistance of hose assemblies – Requirements for test bench.*
- ISO 10380 – *Pipework – Corrugated metal hoses and hose assemblies.*

Other Standards may be accepted where agreed by LR.

## Part 15, Chapter 3

### Machinery Piping Systems

Effective date 1 July 2013

#### ■ Section 4

### Oil fuel systems

#### 4.2 Booster pumps

4.2.3 Ships intending to use Heavy Fuel Oil (HFO) or Marine Diesel Oil (MDO) when operating outside emissions control areas and marine fuels with a sulphur content not exceeding 0,1 per cent m/m and minimum viscosity of 2 cSt when operating inside emission control areas are additionally to meet the requirements of 4.2.4 or 4.2.5.

4.2.4 The booster pumps which are fitted in compliance with 4.2.1 and 4.2.2. are acceptable for use in emissions control areas where these pumps are each suitable for marine fuels with a sulphur content not exceeding 0,1 per cent m/m and minimum viscosity of 2 cSt operation at the required capacity for normal operation of propulsion machinery.

4.2.5 When the booster pumps which are fitted in compliance with 4.2.1 are suitable to operate on marine fuels with a sulphur content not exceeding 0,1 per cent m/m and minimum viscosity of 2 cSt, but one pump alone is not capable of delivering marine fuels with a sulphur content not exceeding 0,1 per cent m/m and minimum viscosity of 2 cSt at the required capacity, two pumps may operate in parallel to achieve the required capacity for normal operation of propulsion machinery. In this case, one additional booster pump is to be provided. The additional booster pump, when operating in parallel with one of the pumps in 4.2.1, is to be suitable for and capable of delivering marine fuels with a sulphur content not exceeding 0,1 per cent m/m and minimum viscosity of 2 cSt at the required capacity for normal operation of the propulsion machinery.

## Part 16, Chapter 1

### Control Engineering Systems

Effective date 1 July 2013

#### ■ Section 1

#### General requirements

##### 1.1 General

1.1.5 Lloyd's Register (hereinafter referred to as 'LR') will be prepared to give consideration to special cases or to arrangements which are equivalent to the Rules where sufficient technical justification is provided.

##### 1.5 Definitions

1.5.1 An Emergency Stop (E-Stop) is a safeguard instigated by a single human action. It requires a stop of all movement within the controlled system as rapidly as possible to prevent a hazard occurring or to reduce an existing hazard to persons, machinery or the vessel.

1.5.2 An Emergency Trip (E-Trip) is a safeguard instigated by a single human action and means the disconnection of fuel, electrical, hydraulic or other power source from the controlled system to prevent a hazard occurring or to reduce an existing hazard to persons, machinery or the vessel. Movement within the system may be allowed to continue.

1.5.3 An Emergency Stop Function may be either an Emergency Stop or Emergency Trip, as appropriate to the system and risk being controlled.

#### ■ Section 2

#### Essential features for control, alarm and safety systems

##### 2.8 Fire detection alarm systems

~~2.8.1 Where an automatic fire detection system is to be fitted in a machinery space the requirements of 2.8.2 to 2.8.14 are to be satisfied.~~

~~2.8.2 A fire detection control unit is to be located in the navigating bridge area, the fire control station, or in some other position such that a fire in the machinery spaces will not render it inoperable.~~

~~2.8.3 Fire detection indicating panels are to denote the section in which a detector or manually operated call point has operated. At least one indicating panel is to be so located that it is easily accessible to responsible members of the crew at all times. An indicating panel is to be located on the navigating bridge, together with TV monitoring in the case of high speed craft.~~

~~2.8.4 An audible fire alarm signal is to be provided having a characteristic which distinguishes it from the alarm signal required by 2.3 or any other alarm system. The audible fire alarm signal is to be immediately audible on all parts of the navigating bridge, at the fire control station and the machinery control stations, and throughout the crew accommodation areas and the machinery spaces.~~

~~2.8.5 Facilities are to be provided in the fire detection system to manually initiate the fire alarm from the following locations:~~

- ~~(a) Positions adjacent to all exits from machinery spaces.~~
- ~~(b) Navigating bridge.~~
- ~~(c) Control station in engine room.~~
- ~~(d) Fire control station.~~

~~2.8.6 The alarm system is to be designed with self-monitoring properties and system failures are to initiate an audible and visual alarm distinguishable from the fire alarm signal. This alarm may be incorporated in the machinery alarm system.~~

~~2.8.7 Power supplies for the alarm system are to be in accordance with Ch 2,17.1.~~

~~2.8.8 Fire detection control units (including addressable systems), indicating panels, detector heads, manual call points and short circuit isolation units are to be Type Approved in accordance with the LR Type Approval System. For addressable systems, see also 2.10.~~

~~2.8.9 Detector heads are to be located in the machinery spaces so that all potential fire outbreak points are guarded. A combination of detectors is to be provided in order that the system will react to all possible fire characteristics.~~

~~2.8.10 When fire detectors are provided with means to adjust their sensitivity, the arrangements are to be such that the set point can be fixed and readily identified.~~

~~2.8.11 When it is intended that a particular loop is to be temporarily switched off, this state is to be clearly indicated at the fire detection indicating panels.~~

~~2.8.12 When it is intended that a particular detector(s) is (are) to be temporarily switched off locally, this state is to be clearly indicated at the local position. Reactivation of the detector(s) is to be performed automatically after a preset time.~~

~~2.8.13 The fire detector heads are to be of a type which can be tested and reset without the renewal of any component. Facilities are to be provided on the fire control panel for functional testing and reset of the system.~~

~~2.8.14 It is to be demonstrated to the Surveyor's satisfaction that detector heads are so located that air currents will not render the system ineffective at sea and in port.~~

## Part 16, Chapter 1

2.8.1 Fire detection and fire-alarm systems are to comply with Chapter 9 of the *Fire Safety Systems Code* (FSS) and 2.8.2 to 2.8.24 as applicable.

2.8.2 Fire detection control units, indicating panels, detector heads, manual call points and short-circuit isolation units are to be Type Approved in accordance with Test Specification Number 1 given in LR's *Type Approval System* for an environmental category appropriate for the locations in which they are intended to operate. For addressable systems, see also 2.10.

2.8.3 The alarm system is to be designed with self-monitoring properties. Power or system failures are to initiate an audible alarm distinguishable from the fire-alarm. This alarm may be incorporated in the machinery alarm system as required by 2.3.

2.8.4 When fire detectors are provided with means to adjust their sensitivity, the arrangements are to be such that the set point can be fixed and readily identified.

2.8.5 The fire detector heads are to be of a type which can be tested and reset without the renewal of any component. Facilities are to be provided on the fire-control panel for functional testing and reset of the system.

2.8.6 When it is intended that a particular loop is to be temporarily switched off, this state is to be clearly indicated at the fire detection indicating panels.

2.8.7 When it is intended that a particular detector(s) is (are) to be temporarily switched off locally, this state is to be clearly indicated at the local position. Reactivation of the detector(s) is to be performed automatically after a preset time.

2.8.8 It is to be demonstrated to the Surveyor's satisfaction that detector heads are so located that air currents will not render the system ineffective whether the ship is at sea or in port.

2.8.9 An audible fire-alarm is to be provided having a characteristic which distinguishes it from the alarm system required by 2.3 or any other alarm system.

2.8.10 Where an automatic fire detection system is to be fitted in a machinery space, the requirements of 2.8.11 to 2.8.15 are also to be satisfied. See also SOLAS 1974, as amended Reg. II-2/C,7, or Chapter 4 as applicable.

2.8.11 Detector heads are to be located in the machinery spaces so that all potential fire outbreak points are guarded. A combination of detectors is to be provided to ensure that the system will react to all possible fire characteristics.

2.8.12 Fire detection indicating panels are to denote the section in which a detector or manually operated call point has operated. At least one indicating panel is to be so located that it is easily accessible to responsible members of the crew at all times. An indicating panel is to be located on the navigating bridge, together with TV monitoring in the case of high speed craft.

2.8.13 A fire detection control unit is to be located in the navigating bridge area, the fire-control station, or in some other position such that a fire in the machinery spaces will not render it inoperable.

2.8.14 The audible fire-alarm is to be immediately audible on all parts of the navigating bridge, at the fire-control station and the machinery control stations, and throughout the crew accommodation areas and the machinery spaces.

2.8.15 Facilities are to be provided in the fire detection system to initiate manually the fire-alarm from the following locations:

- (a) Positions adjacent to all exits from machinery spaces.
- (b) Navigating bridge.
- (c) Control station in engine room.
- (d) Fire control station.

2.8.16 Fire detection systems within the accommodation spaces and cabin balconies are also to comply with 2.8.17 to 2.8.24.

2.8.17 In yachts, the fixed fire detection and fire-alarm systems are to be capable of remotely and individually identifying each detector and manually operated call point. On other craft, indicating units are to denote, as a minimum, the section in which a detector or manually operated call point has operated. At least one indicating unit is to be so located that it is easily accessible to responsible members of the crew. One indicating unit is to be located on the navigating bridge if the control panel is located in the central control station.

2.8.18 Clear information is to be displayed on or adjacent to each indicating unit regarding the spaces covered and the location of the section and, for yachts, each detector and manually operated call point.

2.8.19 The fire detection system is not to be used for any other purpose, except that closing of fire doors and similar functions may be permitted at the control panel. For craft required to comply with the HSC Code, the control panel may be used to activate a paging system, fan stops, closure of fire doors, closure of fire and smoke dampers, and/or a sprinkler system.

2.8.20 In passenger craft other than yachts, where the fire detection system does not include means of remotely identifying each detector individually, a section of detectors is neither to serve spaces on both sides of the craft nor on more than one deck, except when permitted by Ch 2,17.19.

2.8.21 A section of fire detectors and manually operated call points which covers a control station, a service space or an accommodation space is not to include a machinery space of Category A.

2.8.22 The fire control panel is to be located on the navigating bridge or in a central fire-control station and may form part of that panel specified in 2.8.12. In passenger craft carrying more than 36 passengers, the fire-control panel is to be located in the continuously manned central control station.



2.8.23 Detectors and manually operated call points are to be grouped into sections. The activation of any detector or manually operated call point is to initiate a visual and audible fire signal at the control panel and indicating units. If the signals have not received attention within two minutes an audible alarm is to be automatically sounded throughout the crew accommodation and service spaces, control stations and machinery spaces of Category A. For craft required to comply with the HSC Code, there is to be no time delay for the audible alarms in crew accommodation areas, following initiation of an audible and visual alarm at the control panel and indicating units, when all the control stations are unattended. This alarm sounder system need not be an integral part of the detection system.

2.8.24 For electrical engineering requirements, see Ch 2,17.1.

## 2.10 Programmable electronic systems – General requirements

2.10.6 Emergency ~~stop~~ stop functions are to be hard-wired and independent of any programmable electronic equipment. Alternatively, the system providing emergency stop functions is to comply with the requirements of 2.13.2 and/or ~~2.13.9~~ 2.13.8.

## 2.13 Programmable electronic systems – Additional requirements for essential services and safety critical systems

2.13.3 Items of programmable electronic equipment used to implement control, alarm ~~and~~ or safety functions are to ~~satisfy the requirements of~~ be Type Approved in accordance with LR's *Type Approval System Test Specification Number 1* (2002). Type approval to an alternative and relevant National or International Standard may be submitted for consideration.

2.13.8 Where it is intended that the programmable electronic system implements an emergency stop function or safety critical functions, the software is to satisfy the requirements of LR's *Software Conformity Assessment System – Assessment Module GEN1* (1994). Alternative proposals providing an equivalent level of system integrity will be subject to special consideration, e.g., fully independent hard wired back-up system, redundancy with design diversity, etc.

# Part 16, Chapter 2 Electrical Engineering

Effective date 1 July 2013

## ■ Section 1 General requirements

### 1.2 Plans required for design review

1.2.10 A schedule of batteries fitted for use for emergency and essential services, giving details of:

- type and manufacturer's type designation;
- voltage and ampere-hour rating;
- location;
- equipment and/or system(s) served;
- maintenance/replacement cycle dates;
- date(s) of maintenance and/or replacement; and
- for replacement batteries in storage, the date of manufacture and shelf life, with accompanying battery replacement procedure documentation to show compliance with 12.7.

#### NOTE

The above includes all batteries fitted as part of an uninterruptible power system (UPS) used for any essential or emergency services.

### 1.3 Plans required for supporting evidence

1.3.3 Arrangement plans of main and emergency switchboards, and section boards, and documentation that demonstrates that creepage and clearance distances are in accordance with 7.5. The form factor of internal separation of low voltage switchgear and control gear assemblies is to be in accordance with IEC 61439-2: *Low-voltage switchgear and control gear assemblies – Part 2: Power switchgear and control gear assemblies*, or an alternative acceptable and relevant National Standard. The form factor is to be stated, and the arrangement plans are to show how the forms have been achieved.

### 1.7 Design and construction

1.7.4 For areas susceptible to deluge or submersion, cable entries are to prevent water ingress. In general, cable entries are to be in accordance with IEC 60092-101: *Electrical Installations in Ships – Part 101: Definitions and General Requirements*.

## ■ Section 7 Switchgear and control gear assemblies

### 7.1 General requirements

7.1.1 Switchgear and control gear assemblies and their components are to comply with one of the following standards amended where necessary for ambient temperature and other environmental conditions:

- (a) IEC 61439: *Low voltage switchgear and control gear assemblies*;
- (b) IEC 62271-200: *AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV*;
- (c) ~~IEC 60466: *AC insulated enclosed switchgear for rated voltages above 1 kV and up to and including 38 kV*;~~
- (c) IEC 62271-201: *High voltage switchgear and control gear — Part 201: AC insulation-enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV*;
- (d) IEC 60255: *Electrical relays*;
- (e) acceptable and relevant National Standard.

In addition, the requirements of 7.2 to 7.18 are to be complied with.

### 7.3 Circuit-breakers

7.3.6 Air circuit-breakers for essential or emergency services and rated at 800A and above are to have a cumulative count kept of the switching operations of the electrical contacts. This count, along with the manufacturer's details for the circuit-breaker, including the maximum number of switching operations for the electrical contacts, is to be retained on board. These details are to be made available to the Surveyor on request.

### 7.11 Instruments for alternating current generators

7.11.4 The indicators and displays required by 7.11.1 to 7.11.3 are to be located and arranged such that they may be viewed at a single operating position. Where manual paralleling is provided, it is to be possible to adjust voltage and frequency at this position. Generators are to have controls to adjust their voltage and frequency located at the single operating position. Access to voltage adjustment is to be restricted, such that it can only be used by authorised personnel to avoid accidental operation.

## ■ Section 9 Rotating machines

### 9.1 General requirements

9.1.3 ~~Shafts for rotating machines are to be forged or rolled and are to comply with the *Rules for the Manufacture, Testing and Certification of Materials* (hereinafter referred to as the *Rules for Materials*). All machines of 100 kW and over intended for essential services are to be surveyed by the Surveyor during manufacture and test.~~

9.1.4 Shaft materials for rotating machines for essential services are to comply with the *Rules for Manufacture, Testing and Certification*, hereinafter referred to as the Rules for Materials and be manufactured under LR survey for the following applications:

- (a) shaft material for dynamic positioning and electric propulsion motors;
- (b) shaft material for main engine driven generators where the shaft is part of the propulsion shafting; and
- (c) shaft material for machines with power ratings of 250 kW or greater.

Shaft material for machines with power ratings less than 250 kW is to have a manufacturer's certificate as detailed in Chapter 1 of the Rules for Materials.

*Existing paragraphs 9.1.4 to 9.1.8 have been renumbered 9.1.5 to 9.1.9.*

## ■ Section 10 Converter equipment

### 10.3 Uninterruptible power systems

~~10.3.1 Where uninterruptible power systems (UPS) are required to maintain essential services or provide emergency services, the requirements of this Sub-Section apply. This sub-Section is in addition to the requirements of 10.1 and 10.2 and Section 12, as applicable.~~

10.3.1 The requirements of this sub-Section apply to all uninterruptible power systems (UPS) intended to maintain essential services or which provide emergency services. This sub-Section is in addition to the requirements of 10.1 to 10.2 and Section 12, as applicable.

10.3.12 Tests at the manufacturer's works or after installation on board are to include such tests necessary to demonstrate, to the Surveyor's satisfaction, the suitability of a the UPS unit for its intended duty and location. ~~This is expected to include as~~ As a minimum, the following tests are required:

- a temperature rise test ~~and battery capacity test on one of each size and type of UPS~~;
- a battery capacity test;
- ~~the high voltage test of 20.1~~;
- a ventilation rate test of both the equipment housing and the space into which it is to be located, *see also* 12.5; and
- functional testing, including operation of alarms.

Details of tests are to be submitted for consideration when required, *see also* 1.4.2.

## Section 11

### Electrical cables, optical fibre cables and busbar trunking systems (busways)

#### 11.1 General

11.1.1 The requirements of 11.1 to 11.16 apply to all electric and optical fibre cables for fixed wiring unless otherwise exempted. The requirements of 11.16 apply to busbar trunking systems (busways) where they are used in place of electric cables.

**Table 2.11.1 Electric cables**

Application	IEC Standard	Title
General constructional and testing requirements	60092-350	Low-voltage shipboard power cables. General construction and test requirements
Fixed power and control circuits	60092-353	Single and multicore non-radial field power cables with extruded solid insulation for rated voltages 1 kV and 3 kV
Fixed power circuits	60092-354	Single and three-core power cables with extruded solid insulation for rated voltages 6 kV, 10 kV and 15 kV
Instrumentation, control and communication circuits up to 60 V	60092-375	<del>Shipboard telecommunication cables and radio-frequency cables</del> General instrumentation, control and communication cables
Control and instrumentation circuits up to 250 V	60092-376	Shipboard multicore cables for control and instrumentation circuits
Mineral insulated	60702	Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V

11.1.3 Details of optical fibre cables for fixed installation are to be submitted to assess compliance with applicable International or National Standards. These are to include:

- Flame retardancy;
- Fire resistance (if applicable);
- Smoke density;
- Halogen content;
- Mechanical properties;
- Suitability for use in the marine environment.

Existing paragraphs 11.1.3 and 11.1.4 have been renumbered 11.1.4 and 11.1.5.

11.1.5 ~~11.1.6~~ Electric and optical fibre cables for non-fixed wiring applications are to comply with an acceptable and relevant a relevant National or International Standard.

Existing paragraph 11.1.6 has been renumbered 11.1.7.

11.1.8 Electrical cables for telecommunications and data transfer are, whenever practicable, to be selected in accordance with the recommendations of IEC TR 60092-370: *Guidance on the selection of cables for telecommunication and data transfer including radio-frequency cables*.

#### 11.5 Construction

11.5.1 Electric and optical fibre cables are to be at least of a flame-retardant type. Compliance with IEC 60332-1-2: *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1kW pre-mixed flame*, will be acceptable.

11.5.3 Where electric or optical fibre cables are required to be of a 'fire resistant type', they are in addition to be easily distinguishable and to comply with the performance requirements of the appropriate part of IEC 60331: *Tests for electric cables under fire conditions - Circuit integrity*, when tested with a minimum flame application time of 90 minutes, as follows:

IEC 60331-21: *Procedures and requirements – Cables of rated voltage up to and including 0.6/1.0kV*;

IEC 60331-23: *Procedures and requirements – Electric data cables*;

IEC 60331-25: *Procedures and requirements – Optical fibre cables*.

11.5.4 Where electric or optical fibre cables are installed in locations exposed to the weather, in damp and in wet situations, in machinery compartments, refrigerated spaces or exposed to harmful vapours including oil vapour, they are to have the conductor insulating materials or optical fibres enclosed in an impervious sheath of material appropriate to the expected ambient conditions.

11.5.5 Where electric or optical fibre cables are installed in locations which are totally submerged for extended periods of time, they are to have the conductor insulating materials or fibres enclosed in an impervious sheath of material appropriate to the expected submerged conditions and duration.

~~11.5.5~~ 11.5.6 Where it is required that the construction of electrical or optical fibre cables includes metallic sheaths, armouring or braids, they are to be provided with an overall impervious sheath or other means to protect the metallic elements against corrosion, see also 11.8.7 and 11.8.8.

Existing paragraphs 11.5.6 to 11.5.9 have been renumbered 11.5.7 to 11.5.10.

## Part 16, Chapter 2

### 11.6 Conductor size

**Table 2.11.3 Electric cable current ratings, normal operation, based on ambient 45°C (Part only shown)**

Nominal cross-section (mm <sup>2</sup> )	Continuous r.m.s current rating, in amperes								
	Thermoplastic (70°C)			Elastomeric (90°C)			Elastomeric or thermosetting, based on silicon rubber (95°C)		
	Single core	2 core	3 or 4 core	Single core	2 core	3 or 4 core	Single core	2 core	3 or 4 core
0,75	10	8	7	15	13	11	17	14	12
1	12	10	8	18	15	13	20	17	14
1,25	13	11	9	21	18	14	23	20	16
1,5	15	13	11	23	20	16	26	22	18
2	18	15	12	28	24	19	31	26	22
2,5	21	18	15	40 30	26	21	32	27	22
3,5	26	22	18	37	32	26	39	33	28
4	29	25	20	64 40	34	28	43	37	30

### 11.8 Installation of electric cables

**11.8.1** Electric and optical fibre cable runs are to be as far as practicable fixed in straight lines and in accessible positions.

**11.8.2** Bends in fixed electric and optical fibre cable runs are to be in accordance with the cable manufacturer's recommendations. The minimum internal radius of bend for the installation of fixed electric cables is to be chosen according to the construction and size of the cable and is not to be less than the values given in Table 2.11.6.

**11.8.3** The installation of electric and optical fibre cables across expansion joints in any structure is to be avoided. Where this is not practicable, a loop of electric cable of length sufficient to accommodate the expansion of the joint is to be provided. ~~The~~ For electric cables, the internal radius of the loop is to be at least 12 times the external diameter of the cable. For optical fibre cables, the internal radius of the loop is to meet the manufacturer's minimum recommendations.

**11.8.4** Electric and optical fibre cables for essential and emergency services are to be arranged, so far as is practicable, to avoid galleys, machinery spaces and other enclosed spaces and areas of high fire risk except as is necessary for the service being supplied. Such cables are also, so far as reasonably practicable, to be routed clear of bulkheads to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space.

**11.8.6** Electric and optical fibre cables having a protective covering which may damage the covering of other cables are not to be bunched with those other cables.

**11.8.9** Electric and optical fibre cables are to be as far as practicable installed remote from sources of heat. Where installation of cables near sources of heat cannot be avoided and where there is consequently a risk of damage to the cables by heat, suitable shields, insulation or other precautions are to be installed between the cables and the heat source. The free air circulation around the cables is not to be impaired.

**11.8.10** Where electric and optical fibre cables are installed in bunches, provision is to be made to limit the propagation of fire. This requirement is considered satisfied when cables of the bunch have been tested in accordance with the requirements of IEC 60332: *Tests on electric and optical fibre cables under fire conditions, Part 3-22, Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A*, and are installed in the same configuration(s) as are used for the test(s). If the cables are not so installed, information is to be submitted to satisfactorily demonstrate that suitable measures have been taken to ensure that an equivalent limit of fire propagation will be achieved for the configurations to be used. Particular attention is to be given to cables in:

- atria or equivalent spaces; and
- vertical runs in trunks and other restricted spaces.

In addition, cables that comply with the requirements of IEC 60332-3-22 are also required to meet the requirements of IEC 60332-1-2.

**11.8.11** Electric and optical fibre cables are not to be coated or painted with materials which may adversely affect their sheath or their fire performance.

**11.8.12** Where electric and optical fibre cables are installed in refrigerated spaces they are not to be covered with thermal insulation but may be placed directly on the face of the refrigeration chamber, provided that precautions are taken to prevent the electric cables being used as casual means of suspension.

**11.8.13** All metal coverings of electric and optical fibre cables are to be earthed in accordance with 1.12.

**11.8.18** Electric and optical fibre cables are to be, so far as reasonably practicable, installed remote from sources of mechanical damage. Where necessary, the cables are to be protected in accordance with the requirements of 11.9.

**11.8.19** Electric and optical fibre cables, with the exception of those for portable appliances and those installed in protective casings, are to be fixed securely in accordance with the requirements of 11.10.

**11.8.20** Electric and optical fibre cables serving any essential services and any glands through which they pass must be able to withstand flooding for a period of 36 hours, based on the water pressure that may occur at the location.

~~11.8.20~~ **11.8.21** Where electric and optical fibre cables penetrate bulkheads and decks, the requirements of 11.11 are to be complied with.

~~11.8.21~~ **11.8.22** Where electric and optical fibre cables are installed in protective casings, the requirements of 11.12 are to be complied with.

### 11.11 Penetration of bulkheads and decks by cables

**11.11.1** Where electric or optical fibre cables pass through watertight, fire insulated or gas tight bulkheads, the arrangements are to be such as to ensure the integrity of the bulkhead or deck is not impaired. The arrangements chosen are to ensure that the cables are not adversely affected.

**11.11.3** Electric and optical fibre cables passing through decks are to be protected by deck tubes or ducts.

### 11.12 Installation of electric and optical fibre cables in protective casings

**11.12.1** Protective casings are to be mechanically continuous across joints and effectively supported and secured to prevent damage to the electric or optical fibre cables.

**11.12.7** Protective casings containing high voltage electric cables are not to contain other electric or optical fibre cables and are to be clearly identified, defining their function and voltage.

### 11.16 Joints and branch circuits in cable systems

**11.16.1** If a joint is necessary it is to be carried out so that all conductors or fibres are adequately secured, insulated and protected from atmospheric action. The flame retardant properties of the cable are to be retained, the continuity of metallic sheath, braid or armour is to be maintained and the current-carrying capacity or transmission of data through the cable is not to be impaired.

**11.16.2** Tappings (branch circuits) are to be made in suitable boxes of such a design that the conductors and fibres remain suitably insulated, protected from atmospheric action and fitted with terminals or busbars of dimensions appropriate to the current rating.

**11.16.3** Tappings and splices of optical fibre cables are to be made in accordance with the manufacturers' recommendations and to be provided with appropriate fittings. In addition, they are to be located within suitably designed enclosures to ensure that the protection of the optical fibres is maintained.

*Existing paragraph 11.16.3 has been renumbered 11.16.4.*

## Section 13

## Equipment – Heating, lighting and accessories

### 13.3 Incandescent lighting

**Table 2.13.1 Lamps and lampholders**

Designation	Maximum lamp rating		Maximum lampholder current, A
	Voltage, V	Power, W	
Screw cap lamps			
E40	250	3000	16
E27	250	200	4
E14	250	15	2
E10	24	—	2
Bayonet cap lamps			
B22	250	200	4
B15d	250	15	2
B15s	55	15	2
Tubular fluorescent lamps			
G13	250	80 115	—
G5	250	43 80	—
NOTE Other lamp types are to be in accordance with IEC 60092-306: <i>Electrical installations in ships - Part 306: Equipment - Luminaires and lighting accessories.</i>			

## Section 17

## Fire safety systems

### 17.1 Fire detection and alarm systems

~~17.1.1~~ Fire detection and alarm systems are to be in accordance with Chapter 9 of the Fire Safety Systems Code (FSS Code) and 17.1.2 to 17.1.19.

~~17.1.2~~ Fire detection and alarm systems are to be provided with at least two power supplies. One supply is to be connected to the main source of electrical power and another supply is to be connected to the emergency source of electrical power required by 3.2, 3.3 or 3.4, or an accumulator battery capable of supplying power for the same period of time as the emergency source of electrical power. All power supply feeders for fire detection and alarm systems are to be in accordance with 11.6.4.

~~17.1.3~~ Automatic changeover facilities in accordance with 5.3.5 are to be located in, or adjacent to, the main fire control panel. Power supply changeover is to be achieved without adverse effect. Failure of any power supply is to operate an audible and visual alarm. See also 1.15 and 1.16.

~~17.1.4~~ Where an accumulator battery provides a power supply, on restoration of the main source of electrical power, the rating of the charge unit is to be sufficient to recharge the battery while maintaining the output supply to the fire detection and alarm system.



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~~17.1.5 Power supplies from the main and emergency switchboards are to be supplied by separate feeders that are reserved solely for this purpose. Where the emergency feeder for the electrical equipment used in the operation of the fixed fire detection and fire alarm system is supplied from the emergency switchboard, it is to be run from this switchboard to the automatic changeover switch without passing through any other switchboard.~~

~~17.1.6 For machinery spaces the requirements of Ch 1,2.8 are applicable.~~

~~17.1.7 Fire detection systems within the accommodation spaces and cabin balconies are, in addition to the requirements of Chapter 1, as applicable, to comply with 17.1.8 to 17.1.19.~~

~~17.1.8 The fire control panel is to be located on the navigating bridge or in a central fire control station and may form part of that panel specified in Ch 1,2.8.2. In passenger craft carrying more than 36 passengers, the fire control panel is to be located in the continuously manned central control station.~~

~~17.1.9 Detectors and manually operated call points are to be grouped into sections. The activation of any detector or manually operated call point is to initiate a visual and audible fire signal at the control panel and indicating units. If the signals have not received attention within two minutes an audible alarm is to be automatically sounded throughout the crew accommodation and service spaces, control stations and machinery spaces of Category A. For craft required to comply with the HSC Code, there is to be no time delay for the audible alarms in crew accommodation areas, following initiation of an audible and visual alarm at the control panel and indicating units, when all the control stations are unattended. This alarm sounder system need not be an integral part of the detection system.~~

~~17.1.10 In yachts, the fixed fire detection and fire alarm system is to be capable of remotely and individually identifying each detector and manually operated call point. On other craft, indicating units are to denote, as a minimum, the section in which a detector or manually operated call point has operated. At least one unit is to be so located that it is easily accessible to responsible members of the crew. One indicating unit is to be located on the navigating bridge if the control panel is located in the central control station.~~

~~17.1.11 Clear information is to be displayed on or adjacent to each indicating unit about the spaces covered and the location of the section and, for yachts, each detector and manually operated call point.~~

~~17.1.12 Where the fire detection system does not include means of remotely identifying each detector and manually operated call point individually no section covering more than one deck within accommodation, service spaces and control stations is normally to be permitted except a section which covers an enclosed stairway. The number of enclosed spaces in each section are to be limited to the minimum considered necessary in order to avoid delay in identifying the source of fire. In no case are more than fifty spaces permitted in any section.~~

~~17.1.13 In passenger craft other than yachts, where the fire detection system does not include means of remotely identifying each detector individually a section of detectors is neither to serve spaces on both sides of the craft nor on more than one deck except when permitted by 17.1.18.~~

~~17.1.14 A section of fire detectors and manually operated call points which covers a control station, a service space or an accommodation space is not to include a machinery space of Category A.~~

~~17.1.15 The fire detection system is not to be used for any other purpose, except that closing of fire doors and similar functions may be permitted at the control panel. For craft required to comply with the HSC Code, the control panel may be used to activate a paging system, fan stops, closure of fire doors, closure of fire and smoke dampers, and/or a sprinkler system.~~

~~17.1.16 A loop circuit of an addressable fire detection system, capable of remotely identifying from either end of the loop, individually each detector and manually operated call point served by the circuit, may serve spaces on both sides of the craft and on several decks, but is not to be situated in more than one main vertical or horizontal fire zone, nor is a loop circuit which covers an accommodation space, service space and/or control station to include a machinery space of Category A.~~

~~17.1.17 A loop circuit of an addressable fire detection system may comprise one or more sections of detectors and manually operated call points. Where the loop comprises more than one section, the sections are to be separated by devices which will ensure that if a short-circuit occurs anywhere in the loop, only the affected section of detectors and manually operated call points will be isolated from the control panel. No section of detectors and manually operated call points is in general to include more than 50 detectors.~~

~~17.1.18 A section of fire detectors and manually operated call points is not to be situated in more than one main vertical or horizontal fire zone. Additionally, for craft required to comply with the HSC Code, a section of detectors and manually operated call points section of detectors of an addressable fire detection system is neither to serve spaces on both sides of the craft nor on more than one deck, except that:~~

- ~~(a) a section of detectors and manually operated call points may serve spaces on more than one deck if those spaces are located in either the fore or aft end of the craft, or they constitute common spaces occupying several decks, i.e. public spaces, enclosed stairways, etc.~~
- ~~(b) in craft of less than 20 m in breadth, a section of detectors and manually operated call points may serve spaces on both sides of the craft.~~

~~17.1.19 The wiring for each section of detectors and manually operated call points in an addressable fire detector system is to be separated as widely as practicable from that of all other sections on the same loop. When this is not practical, such as in large public spaces, the part of the loop which by necessity passes through the space for a second time is to be installed at the maximum possible distance from other parts of the loop.~~

**17.1.1** Fire detection and alarm systems are to be in accordance with Chapter 9 of the *Fire Safety Systems Code* (FSS Code) and 17.1.2 to 17.1.10.

**17.1.2** Fire detection and alarm systems are to be provided with at least two power supplies. One supply is to be connected to the main source of electrical power and another supply is to be connected to the emergency source of electrical power required by 3.2, 3.3 or 3.4, or an accumulator battery capable of supplying power for the same period of time as the emergency source of electrical power. All power supply feeders for fire detection and alarm systems are to be in accordance with 11.6.4.

**17.1.3** Automatic changeover facilities in accordance with 5.3.5 are to be located in, or adjacent to, the main fire-control panel. Power supply changeover is to be achieved without adverse effect. Failure of any power supply is to operate an audible and visual alarm. See also 1.14 and 1.16.

**17.1.4** Where an accumulator battery provides a power supply, on restoration of the main source of electrical power, the rating of the charge unit is to be sufficient to recharge the battery while maintaining the output supply to the fire detection and alarm system.

**17.1.5** Power supplies from the main and emergency switchboards are to be supplied by separate feeders that are reserved solely for this purpose. Where the emergency feeder for the electrical equipment used in the operation of the fixed fire detection and alarm system is supplied from the emergency switchboard, it is to be run from this switchboard to the automatic changeover switch without passing through any other switchboard.

**17.1.6** A loop circuit of an addressable fire detection system, capable of remotely identifying individually each detector and manually operated call point served by the circuit, from either end of the loop, may serve spaces on both sides of the craft and on several decks, but is not to be situated in more than one main vertical or horizontal fire zone, nor is a loop circuit which covers an accommodation space, service space and/or control station to include a machinery space of Category A.

**17.1.7** A loop circuit of an addressable fire detection system may comprise one or more sections of detectors and manually operated call points. Where the loop comprises more than one section, the sections are to be separated by devices which will ensure that, if a short-circuit occurs anywhere in the loop, only the affected section of detectors and manually operated call points will be isolated from the control panel. No section of detectors and manually operated call points is in general to include more than 50 detectors.

**17.1.8** For ships other than passenger ships where the fire detection system does not include means of remotely identifying each detector and manually operated call point individually, no section covering more than one deck within accommodation, service spaces and control stations is normally to be permitted except a section which covers an enclosed stairway. The number of enclosed spaces in each section is to be limited to the minimum considered necessary in order to avoid delay in identifying the source of fire. In no case are more than 50 spaces permitted in any section.

**17.1.9** A section of fire detectors and manually operated call points is not to be situated in more than one main vertical or horizontal fire zone. Additionally, for craft required to comply with the HSC Code, a section of detectors and manually operated call points of an addressable fire detection system is neither to serve spaces on both sides of the craft nor on more than one deck, except that:

- (a) a section of detectors and manually operated call points may serve spaces on more than one deck if those spaces are located in either the fore or aft end of the craft, or they constitute common spaces, occupying several decks, i.e., public spaces, enclosed stairways, etc.
- (b) in craft of less than 20 m in breadth, a section of detectors and manually operated call points may serve spaces on both sides of the craft.

**17.1.10** The wiring for each section of detectors and manually operated call points in an addressable fire detector system is to be separated as widely as practicable from that of all other sections on the same loop. Where practicable, no loop is to pass through a space twice. When this is not practicable, such as in large public spaces, the part of the loop which by necessity passes through the space for a second time is to be installed at the maximum possible distance from other parts of the loop.

## ■ Section 20

### **Cargo craft, patrol and pilot craft, workboats and other similar craft of less than 500 tons gross tonnage for operation in Service Groups 1 to 3, and yachts less than 500 gt**

#### **20.11 Cables**

**20.11.2** Where the emergency services referenced in Section 1.14 are fitted, their cables are required to be in accordance with 1.14.2 to 1.14.4.

#### **20.15 Fire safety stops**

**20.15.1** Stops for ventilation fans for machinery spaces and enclosed galleys are to comply with the applicable paragraphs of 17.6.

*Existing sub-Section 20.15 has been renumbered 20.16.*

**Cross-References**

Section numbering in brackets reflects any Section renumbering necessitated by any of the Notices that update the current version of the Rules for Special Service Craft.

**Part 16, Chapter 2**

- |         |                                  |
|---------|----------------------------------|
| 11.8.17 | 11.5.7 <i>now reads</i> 11.5.8   |
| 12.3.5  | 12.5.10 <i>now reads</i> 12.5.11 |





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